



Mount Rainier National Park

Sister Mountain Project

Get Ready to Go! Map Reading

Overview	Students will be introduced to the basic skills necessary to read a map, specifically a topographic map, in a national park. Students will practice by orienting a map to magnetic north and/or true north. Students will also have the ability to practice land navigation around their school based on a course set up by the instructor.
Grade Level	Grades 5 to 12
Objectives	<p>Students will be able to:</p> <ul style="list-style-type: none">• Identify key elements on a topographic map including elevation lines, compass rose, trails, roads, and key features such as hills and valleys.• Orient a map to magnetic and true north• Travel on a relatively flat course using a map of the school or local area.
Setting	Classroom, outdoor space, gymnasium
Timeframe	50 minutes
Materials	<p>This lesson requires the following materials:</p> <ul style="list-style-type: none">• Site map of the school with magnetic north identified on it. A topographic map of the site is best.• Set the maps up according to the attached "Instruction" page• One copy of the site map for every 2 or 4 students• Magnetic Compasses – 1 for every 2 students is ideal, 1 for every 4 students can work. (This activity can be completed without a compass as well.)• Markers for use on the school grounds• Marker Cards for students
Vocabulary	<p>Site map: A map of your local area, such as your school where you are teaching</p> <p>Topographic map: a map showing topographic features, usually by means of contour lines.</p> <p>GPS: Global Positioning System</p> <p>Compass: an instrument for determining directions, as by means of a freely rotating magnetized needle that indicates magnetic north.</p> <p>Compass Rose: a circle divided into 32 points or 360° numbered clockwise from true or magnetic north, printed on a chart or map.</p> <p>Never Eat Soggy Waffles – North, East, South, West (an acronym to help remember the four cardinal points of a compass).</p>

Standards	Health and Fitness GLE 1.2.1 and 1.2.2
Background	Map reading as a skill is one that is increasingly becoming lost due to the age of technology, GPS, and online mapping programs which provide turn by turn directions to any specific site. The ability to read a map properly in the field is a critical skill when hiking. The hiker who is able to read a map will be able to cover more ground safely and is less likely to get lost than the hiker who has minimal skills with map reading.
Procedure	<p>Set-Up Required for this lesson:</p> <ol style="list-style-type: none"> 1. Prior to activity set a course around the campus, as appropriate for grade level, for the students to navigate. (see attached instructions) 2. Prepare an overhead or PowerPoint of the site map for students to view. <p>Activity:</p> <ol style="list-style-type: none"> 1. Introduce the students to the activity by asking several questions such as, "How do we find our way around school?", "How do we find our way around our neighborhood?", "How do you know where to go when you aren't sure how to get there?" 2. Allow the students to discuss several methods of getting from one point to another and discuss the pros and cons of each. 3. Ask the students, "How will you get from point A to point B when you do not have technology to help you?" 4. Lead the discussion to the use of maps and compasses to assist us in finding our way. 5. Have the students gather in groups of 2 to 4 and hand out copies of the site maps. Ask them to orient the maps so that they are aligned with magnetic north, or so that they are aligned with the way the school is set up. 6. Discuss why they chose to align their maps in this manner. 7. Correct any errors in the map alignment. If compasses are available, show the students how to orient the map with magnetic north. 8. Discuss why this is important when travelling on trails. (See attached Notes). 9. At random, assign each group a sequence from the attached "Instructions" page. Tell students that these correlate to points on the map. 10. The job of the groups is to go to each of the points and mark their points, in order, on their groups "marking sheet". 11. Give the students 15 – 20 minutes for this activity depending on the distance they will travel between each point. 12. At the completion of the lesson, debrief on the activity. "What worked?", "What did not work?", "What made the activity easy?", and "What were the challenges?" "Would this be easier or more difficult in the woods and why?" <p>Note: Depending upon the ability level of the students, this lesson can easily be adapted to a two day lesson. On Day One, the teacher instructs the students in the use of the map and compass. On Day Two, the teacher reviews the use of map and compass and the students participate in the map reading activity.</p>
Suggested Assessment	The attached "marking sheets" can serve as the assessment for the activity on a completed/not completed basis.

Adaptations	<ul style="list-style-type: none"> • This could be completed as an introduction to an orienteering unit in the health and fitness class. • For more advanced classes, place the markers farther apart and give them a specific order of markers to find. • Utilize a GPS system to track the coordinates. The student records each set of coordinates when the site is reached. • For younger students, keep the markers within a reasonable distance of the teacher and clearly labeled. Such as the gymnasium or a small section of the playground.
Extensions	<ul style="list-style-type: none"> • There are a great number of websites and programs that the teacher could utilize to teach orienteering as a health and fitness unit. • Students who are familiar with orienteering could be provided the opportunity to teach this activity to small groups or the class. • Integrate with the Social Studies teacher to teach map reading skills. The social studies teacher could teach the components of the map while the health and fitness educator completes a more complex map reading activity. • Create several GPS waypoint on a map and have the students navigate through these points in a similar style course. • Create a GPS course on your school site and provide the students with coordinates. Students find them in a scavenger hunt format. • Local outdoor groups often teach orienteering and map reading as a class or competitive activity. These groups are often willing to provide some level of assistance in teaching map reading or orienteering to your class. Contact with them can be beneficial for the educator as they may provide instruction and/or materials for use at the school site.
References/ Resources	<p>Websites:</p> <p>U.S. Orienteering Federation Website http://www.us.orienteering.org/</p> <p>Click on the menu bar at the top to find the Lesson Plan section which provides several links to web based resources, publication recommendations, and a link to their 34 page lesson guide for teaching orienteering to middle school and high school students.</p> <p>The Art of Teaching Map and Compass: Instructional Techniques, Curricular Formats and Practical Field Exercises by Ron Watters, Director Idaho State University Outdoor Program http://www.isu.edu/outdoor/maplong.htm</p> <p>This online report provides activities and research related to teaching map and compass reading plus several recommendations for additional resources.</p> <p>Boy Scouts of America Orienteering website http://www.scouting.org/scoutsource/BoyScouts/AdvancementandAwards/MeritBadges/mb-ORIE.aspx</p>

This site provides the requirements for the Boy Scouts of America Orienteering merit badge and can be a source for possible assessment requirements for an educator teaching orienteering. Links to other sites are provided to assist the educator.

Geocaching - The Official Global GPS Cache Hunt Site

<http://www.geocaching.com/>

The official site of geocaching and geocaching sites for GPS. This site provides a host of geocache sites around the world that are searchable using a GPS system. This site provides all the information you need to get started geocaching.

United States Geologic Survey – Resources for Secondary Grades

<http://education.usgs.gov/common/secondary.htm>

This website provides access to a variety of teaching resources for secondary grade students, including map teaching resources, teaching topographic maps, and map teaching tools.

United States Geologic Survey – Map Database

http://education.usgs.gov/common/map_databases.htm

This site provides access to several United States maps, including a free map locator and downloader.

Teaching Orienteering: 2nd Edition by Carroll McNeill, Jean Cory-Wright, and Tom Renfrew. Copyright 1998.

<http://www.humankinetics.com/products/all-products/teaching-orienteering-2nd-edition?isbn=0880118040&>

A great reference book for those educators considering teaching orienteering in a health and fitness class setting.